

(No Model.)

L. GATHMANN.

HIGH EXPLOSIVE PROJECTILE AND GUN FOR THROWING SAME.

No. 569,190.

Patented Oct. 13, 1896.

Fig. 1.

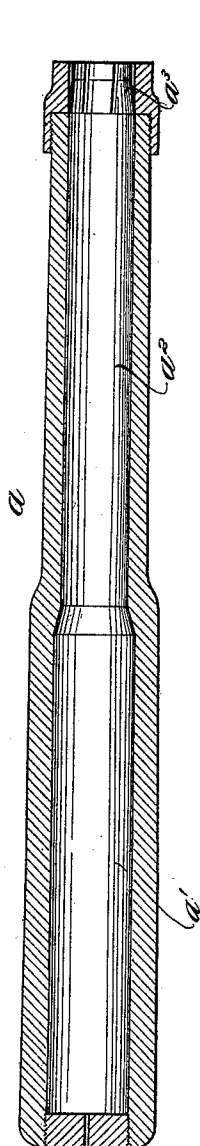


Fig. 2.

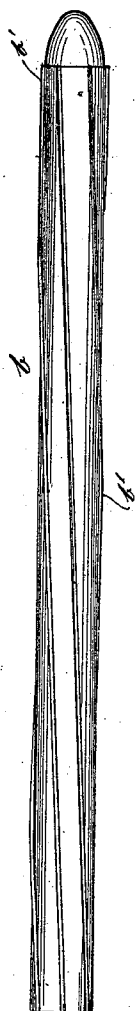


Fig. 3.



Fig. 4.

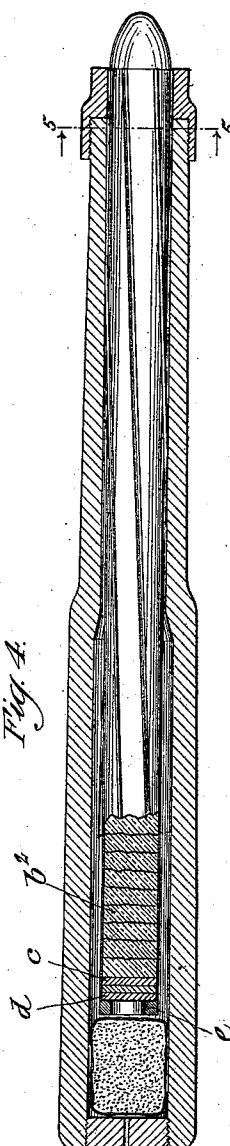
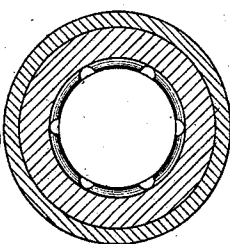


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

LOUIS GATHMANN, OF CHICAGO, ILLINOIS.

HIGH-EXPLOSIVE PROJECTILE AND GUN FOR THROWING SAME.

SPECIFICATION forming part of Letters Patent No. 569,190, dated October 13, 1896.

Application filed July 10, 1893. Serial No. 480,100. (No model.) Patented in England June 17, 1893, No. 9,256.

To all whom it may concern:

Be it known that I, LOUIS GATHMANN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Guns, (for which I have obtained Letters Patent of Great Britain, No. 9,256, dated June 17, 1893;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel method of throwing projectiles containing high explosives, the object being to provide a gun from which a projectile having a light shell and a large charge can be efficiently thrown.

The invention consists in the novel features hereinafter fully described and specifically claimed.

In the accompanying drawings, Figure 1 is a central longitudinal section of a gun constructed in accordance with my invention. Fig. 2 is a side elevation of the projectile. Fig. 3 is a cross-section of the projectile. Fig. 4 is a central longitudinal section of the gun with the projectile in place. Fig. 5 is a cross-section, on an enlarged scale, taken on the line 5 5 of Fig. 4.

It is well known that in order to throw torpedoes or explosive projectiles to a great range it is necessary to use power enough to give said shell a high muzzle velocity. It is also known that the greater the speed to be imparted to said torpedo or explosive projectile the heavier it is necessary to construct the latter in order that there may be no danger of its fracture in undue time. This is principally of importance where the torpedo or projectile is loaded with large masses of high explosives. At present all the known systems have this defect, that the greater part of the weight of torpedoes or shells consists of metal, thereby leaving but little room for the high explosive and necessitating the construction of a heavy piece of ordnance to harmonize with its projectile, so that by the present systems such weapon cannot be adapted for light-built cruisers or torpedo-boats.

It is well known that some of the most powerful high explosives, such, for instance, as

wet gun-cotton, will not explode by a shock or by any pressure that is brought to bear on them.

My invention has for its object to overcome the above objections by means of an improved construction and method and projectile, whereby I am enabled to fire with safety a torpedo or explosive projectile containing a large quantity of high explosive and constructed with a lighter shell than can be at present used, and whereby a torpedo or projectile of a given diameter is enabled to contain a larger amount of explosive and to be fired from a lighter gun than under the old systems.

According to my invention I prefer to form the gun *a* with a charge-chamber *a'* of considerable length and having a larger diameter than that of the torpedo or explosive projectile. The main part *a²* of the forward portion of the bore is of a smaller diameter and is unrifled, so that the torpedo or projectile *b* shall loosely fit the same. The muzzle end of the gun has, however, a short rifled portion *a³*, preferably a ring screwed thereon, formed to fit closely the body and wings or ribs *b'* of the torpedo or projectile *b*. The wings or ribs *b'* fit freely the smooth-bored part *a²* of the gun, and the torpedo or projectile *b* is charged with a high explosive tightly packed therein, as indicated at *b²*, and confined therein by disks *c* of asbestos and a metal disk *d*, confined by the open screw-ring *e*. Its shell is lighter than usual and with a gun formed as shown it extends considerably into the charge-chamber *a'*.

With a gun and torpedo or projectile of the character above described, the gas arising from the gun charge has free access not only to its rear end but also to the exterior of the torpedo or projectile as far as the rifled ring or part *a³*. The shell of the torpedo or projectile is therefore under compression along nearly its entire length, but its internal charge of tightly-compressed explosive supports it against being crushed. By these means I avoid the bulging of the shell of the torpedo or projectile, which sometimes results in its being jammed in the gun and even in the destruction of the torpedo or projectile and gun, which would be likely to result if the torpedo or projectile were made with a

light shell and were subjected to the pressure of the gas only at the rear end.

In order, however, to adapt the gun to the throwing of projectiles to great distances and
5 with a high muzzle velocity, I preferably employ in all cases a projectile having an opening in its base whereby to permit the gases of the expelling charge to have free access to the interior of the shell, thereby creating an
10 equilibrium of pressures both inside and outside of the torpedo or projectile, thus enabling the use under all conditions and circumstances of a projectile having a relatively light shell and a large amount of explosive
15 material. The size of this opening may vary with the range to which the particular gun is adapted. As shown in the drawings, the base of the shell is entirely open except for the ring which is used to mechanically confine the charge within the shell. Where free
20 access of the gases of the expelling charge to the interior of the shell is provided for, the gases exert a pressure upon the explosive material packed within the shell, tending to further compress such explosive charge and acting
25 through this tightly compressed mass upon the forward end of the shell to drive or draw the latter out of the gun, while at the same time establishing and maintaining an
30 equilibrium of pressures internally and externally and thus insuring the expulsion of the shell from the gun in integral form. The gases of the expelling charge also penetrate all of the interstices of the explosive material packed within the shell.

By using a torpedo or projectile, as herein described, containing a large body of high explosive and constructed with a light shell it is not necessary to give it such a velocity
40 as to penetrate the object aimed at, as on account of its large charge it is only necessary to cause it to strike said object and to explode against the same to insure its destruction or considerable damage thereto.

45 Referring to German Patent No. 74,793, granted to me April 27, 1893, I wish to state

that while there is some similarity in construction of the gun as described in said patent I do not herein claim the construction described in said German patent.

I claim as my invention—

1. A gun for throwing rifled explosive projectiles having the bore at the muzzle end thereof rifled and fitting closely such rifled
55 projectile, the main part of the bore in the rear of said rifled portion and to about midway between the ends of the gun being smooth and larger than the projectile, and the bore in the rear of said main part being still larger, while its rear end provides the charge-chamber,
60 substantially as described.

2. A gun having its bore constructed in three sections, namely, a charge-chamber a' , an intermediate portion a^2 smaller than said
65 charge-chamber a' , and the rifled muzzle portion a^3 smaller than said intermediate portion a^2 , substantially as described.

3. The herein-described improvement in ordnance consisting of a gun having an enlarged bore and adapted to a projectile of
70 smaller diameter than the bore, said projectile having an open base through which a portion of the expelling charge may pass, while the remainder of the expelling-gases fill the enlarged bore and envelop the shell, substantially
75 as described.

4. The method of firing a light shell charged with high or other explosives, which consists in exploding the expelling charge at the base of the shell and simultaneously transmitting
80 the pressure due to the explosion of the propelling charge to the interior and exterior of the shell, whereby the interior and exterior pressures thereon are so equalized as to support and secure its expulsion in integral form,
85 substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS GATHMANN.

Witnesses:

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RUDOLPH W. LOTZ.